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**PALM BEACH COUNTY, FLORIDA  
AIR POLLUTION CONTROL PROJECT  
ENVIRONMENTAL PROTECTION AGENCY  
GRANT NO. 73A-1102 RI**

**ANNUAL PROGRESS REPORT  
1972**

**For Reference**

Not to be taken from this room

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I.  
INTRODUCTION

Palm Beach County continues to grow at a very rapid rate. The growth is indicated by the latest population estimates shown in Table 1. In addition, this growth factor is also indicated by the tremendous increase of building permits issued for multi-family dwelling units this past year. 13,991 permits were issued in 1971 as compared to 27,798 permits issued in 1972, an increase of 98.7%.

Tourism and related fields continue to be major factor in the economy of the area. In fact the tourist industry has also greatly increased. One of the several indicators that borne out the increase is the number of passengers deplaning at Palm Beach International Airport. As an example; 53,994 passengers deplaned during the month of December 1971 compared to 65,880 passengers that deplaned during the month of December 1972, an increase of approximately 18%.

Industry continues to increase in the county with the most significant additions in the fields of cement, asphalt, construction, and agriculture.

The local program is keeping abreast of this rapid growth. Advances are continually made to make the public cognizant of our monitoring, emission inventory, enforcement, and both our ground and aerial surveillance procedures.

The monitoring capabilities of the program have been enhanced since the activation of the Environmental Control Air Monitoring Laboratory which consist of a 30 foot travel trailer, located in West Palm Beach. The location was chosen based on the greatest populated region, anticipated increase in population, presence of commercial and industrial activities, diurnal, seasonal and long range meteorological data. The sampling equipment installed in the lab is capable of measuring NO<sub>2</sub>, SO<sub>2</sub>, total oxidants, CO, total hydrocarbons, and meteorological parameters, such



as, wind direction, wind speed, temperature, and relative humidity. All the aforementioned data is collected through the use of recorders plus a centrally controlled digital data acquisition system. The primary elements of the data acquisition system consist of remotely located air analyzers, a remote acquisition and telemetry system, leased telephone lines, a centrally located interface unit, system controller with associated peripherals for data logging and programming. The data is transmitted via telephone lines from the air monitoring laboratory to the Division of Environmental Services headquarters located at 2240 Palm Beach Lakes Boulevard, West Palm Beach. In addition, our Hi-Vol and dustfall sampler network has increased from eight (8) to twelve (12) sites. A mobile air pollution program is anticipated to supplement the fixed network design utilizing a step-van now available, to enable more intensive sampling at all the Hi-Vol and Dust fall collection sites. The mobile step-van will also be employed for sampling of selected areas during periods of special interest.

The people of Palm Beach County are becoming more aware of the need for a thorough Air Pollution Program. In an effort to satisfy these needs the program has increased in scope in order to maintain good air quality. Progress, as described, has made the past year beneficial to all concerned.

TABLE 1  
PALM BEACH COUNTY, FLORIDA

POPULATION

	U. S. CENSUS 4-1-70	A.P.B. 4-1-71	U. OF FLA DIVISION OF POPULATION SERVICES
Tequesta	2,642	2,916	3,655
Jupiter	3,136	3,454	4,624
Jupiter Inlet Colony	396	407	432
Juno Beach	747	751	850
Palm Beach Gardens	6,102	6,614	7,620
North Palm Beach	9,035	9,959	10,923
Lake Park	6,993	7,108	7,470
Riviera Beach	21,401	21,684	23,663
Palm Beach Shores	1,214	1,217	1,526
Mangonia Park	827	827	862
West Palm Beach	57,375	57,613	59,293
Palm Beach	9,086	9,287	10,040
Golfview	201	203	198
Haverhill	1,034	1,043	1,078
Royal Palm Beach	475	491	1,088
Cloud Lake	136	136	136
Glenridge	216	216	216
Lake Clarke Shores	2,328	2,398	2,565
Palm Springs	4,340	4,490	5,500
Greenacres City	1,731	1,792	2,884
Lake Worth	23,714	24,494	25,179
Atlantis	425	464	724
Lantana	7,126	7,324	7,357
South Palm Beach	188	190	318
Manalapan	205	210	226
Hypoluxo	336	345	342
Boynton Beach	18,115	19,646	24,091
Ocean Ridge	1,074	1,094	1,139
Golf	50	51	52
Gulfstream	408	440	455
Briny Breezes	481	481	918
Delray Beach	19,366	19,842	23,722
Highland Beach	624	1,000	1,358
Boca Raton	28,506	30,638	37,590
Wahokee	5,663	5,762	5,093
Belle Glade	15,949	16,114	17,105
South Bay	2,958	2,995	3,050
Total Incorporated Area	255,051	263,873	293,342
Unincorporated	93,118	96,136	95,268
TOTAL	348,753	360,867	388,610



## II. M E T E O R O L O G Y

### GENERAL

Table 2 illustrates weather data accumulated at Palm Beach International Air port for the past 29 years. August is the warmest month with a mean of 83°F, a maximum mean of 91.1°F, and minimum mean of 74.8°F. From the same data, January is the coldest month with a mean of 66.9°F, a maximum mean of 75.5°F and a minimum mean of 58.3°F. Rainshowers and/or thunderstorms of short duration are frequent during the summer season. Palm Beach County receives the greatest amount of rain fall during the summer and fall. As indicated in the table the County receives approximately 61.7 inches of rain per year.

Palm Beach County can be classified as a semi-tropical region. The quasi-permanent location of the "Bermuda" high pressure area governs our weather. It causes prevailing easterly surface winds in addition to supplying the warm moist air necessary to produce the frequent air mass, frontal or nocturnal rainshowers and/or thunderstorms that occur in the County. The position of the "Bermuda" high pressure area is also conducive to the formation of atmosphere capable of causing high pollution days. This atmosphere can easily occur if cold air from the north moves underneath the warm moist air brought into the County by the "Bermuda" high. The result is a temperature inversion of increase of temperature with height which traps the pollutants in the lower levels.

### ATMOSPHERIC STABILITY

The dilution of pollutants in the atmosphere depends greatly on the vertical temperature gradient in the first few hundred feet of our atmosphere. When the vertical temperature gradient decreases with height the atmosphere is unstable and

good dilution of pollutants is the result. This normally occurs in Palm Beach County during the summer season and/or the warmer hours of each day. If the vertical temperature gradient increases with height within the first few hundred feet of the atmosphere a stable condition is caused, often called an inversion, which results in poor dilution of pollutants. This occurs in Palm Beach County more frequently during the winter and fall seasons and/or the cooler hours of each day. If pollutants are present during these periods they are trapped beneath the inversion and remain there until the inversion is dissipated by surface heating.

Recently, Mr. Harold P. Gerrish of the Meteorology Department at the University of Miami conducted a thorough study and prepared a paper entitled, "Analysis of Low-Level Temperature Inversions in the Miami Area Using Instrumented Towers." He placed two instrumented towers in the Miami Area, one on the coast and the other 16 miles inland. The analysis of the temperature data revealed that nocturnal inversions occurred almost every night within 200 feet of the ground. The inversions that occurred inland were 3-4 times stronger than those that occurred on the coast. The inversions lasted approximately 10 hours inland. He showed that the inversions formed shortly after sunset and dissipated shortly after sunrise. The sampling period began on February 27, 1971, and lasted until May 27, 1971. Mr. Gerrish points out that the results of his study have several environmental implications, such as serious night time air pollution situations as a result of the daily nocturnal inversions, and good industrial planning is absolutely necessary in order to avoid future pollution problems. He also mentions that inversions cause increased sound problems and consequently noise pollution could become widespread without good planning.



TABLE 2  
MEANS AND EXTREMES  
PALM BEACH COUNTY AIRPORT (1931 - 1960)

MONTH	MEAN MAXIMUM TEMPERATURE	MEAN MINIMUM TEMPERATURE	MEAN MONTHLY TEMPERATURE	MEAN MONTHLY PRECIP. (IN.)	PREVAILING WIND DIRECTION	MEAN WIND SPEED
JANUARY	75.5 -	58.3	66.9	2.48	NW	10.0
FEBRUARY	76.5	58.6	67.6	2.35	SE	10.4
MARCH	78.6	61.1	69.9	3.44	SE	10.7
APRIL	82.4	65.4	73.9	4.34	E	10.8
MAY	85.9	69.2	77.6	5.11	ESE	9.6
JUNE	89.2	72.7	81.0	7.53	ESE	8.0
JULY	90.8	74.3	82.6	6.66	ESE	7.5
AUGUST	91.1	74.8	83.0	6.74	ESE	7.4
SEPTEMBER	89.7	74.5	82.1	9.66	ENE	8.8
OCTOBER	85.2	71.1	78.2	7.96	ENE	10.0
NOVEMBER	80.2	64.8	72.5	2.86	ENE	9.9
DECEMBER	76.9	59.4	68.2	2.57	NNW	9.7
YEAR	83.5	67.0	75.3	61.7	ESE	9.4

The foregoing information has been brought forth in this report because of the great similarity in climate and topography of the Miami area and Palm Beach County area. Our Agency completely agrees with the Gerrish paper and is aware of the high frequency of nocturnal inversions in Palm Beach County, mainly the inland agricultural regions. Unfortunately, resources have not allowed instrumented towers to confirm the high frequency of nocturnal inversions in Palm Beach County and therefore, our awareness is based on visual observation only. Our future plans include the installation of an instrumented tower in order to measure the frequency of inversions. It is mandatory that the high frequency of inversions be considered in any future planning and zoning of Palm Beach County in order to eliminate future air and noise pollution problems.

#### WIND

The wind, both direction and speed are of primary importance. The surface wind and the wind found in the first few hundred feet of our atmosphere must be studied to determine diffusion and movement of the pollutants. The wind direction is indicative of the direction of travel of the pollutants. The wind speed determines the time it takes the pollutant to travel to a receptor plus the dilution of the pollutants is a function of the speed. Light winds, coupled with other factors, contribute to poor air quality episodes. U. S. Weather Service records for Palm Beach International Airport show the prevailing wind directions for the months of February through November are from one of the easterly headings. Mean monthly speeds vary between 7.4 knots in August and 10.8 knots in April (Table 2). The wind direction and speed for the year 1972 (Table 3) shows that the highest percentage of our wind come to us from an easterly heading and the majority of the wind speeds were in the 4-16 knot category.



TABLE 3  
PALM BEACH INTERNATIONAL AIRPORT (P.B.I.A.)  
WIND DIRECTION AND SPEED (KNOTS) OCCURRENCES - YEAR 1972

DIRECTION	1-3	4-6	7-10	11-16	17-21	22-27	TOTAL	PERCENT
35-36-01 (N)	4	24	29	20	7	2	86	2.9
02-03-04 (NNE)	3	14	45	53	14	3	132	4.5
05-06-07 (ENE)	2	37	139	138	43	6	361	12.4
08-09-10 (E)	7	58	209	171	27	2	472	16.2
11-12-13 (ESE)	21	100	165	82	5	1	374	12.8
14-15-16 (SSE)	9	89	85	46	9	1	239	8.2
17-18-19 (S)	16	89	62	19	2		188	6.4
20-21-22 (SSW)	16	87	42	14	3		162	5.5
23-24-25 (WSW)	18	70	80	42	4		214	7.3
26-27-28 (W)	20	64	37	16	2	3	142	4.9
29-30-31 (WNW)	22	75	57	26	4		184	6.3
32-33-34 (NNW)	15	71	50	27	10	1	174	6.0
CALM	192						192	6.6
TOTAL	345	778	994	654	130	19	2920	
PERCENT	11.8	26.6	34.0	22.4	4.5	0.7		100.0

Multiply by 1.15  
to obtain M.P.H.

III.  
C O M P L A I N T S

During the period, January 1, 1972 through December 31, 1972 a total of 106 complaints dealing with air pollution were received by this office. These can be classified as follows:

1. Industrial fumes or dust	16
2. Commercial incinerators	6
3. Open Burning	
a. dump	32
b. land clearing	57
c. others (agricultural, etc.)	61
4. Internal Combustion Fumes or Exhaust	7
5. Food establishment odors	1
6. Pollen deposits	3
7. Construction dust and Fumes	4
8. Unknown sources	14
9. Miscellaneous Sources	13
TOTAL	<u>214</u>

During this specific report period, open burning sources produced over 70% of all complaints. An 85% decrease in commercial incinerator complaints as compared to the last report period is attributable to the dwindling number of these small units still in operation. The few operational units are generally modern and kept in a good state of repair. Complaints regarding these units are generally caused by operational neglect or error.

Most of the complaints classified as miscellaneous resulted from an outbreak of red tide, a natural phenomenon commonly occurring in the Gulf of Mexico



## COMPLAINTS (CONT.)

particularly along the western coast of Florida. This phenomenon, often referred to as a red tide bloom, is a result of the increase in numbers of a particular micro organism. The bloom that occurred in this area resulted in relatively large fish kills and was also responsible for the release of noxious "fog". It is also felt that many of the sources classified as unknown may have been directly related to this red tide outbreak.

Complaints concerning industrial fumes and dust, internal combustion fumes and construction fumes and dust, resulted from the tremendous increase in industrially related activities.

IV.  
T R A I N I N G

Mr. Eugene J. Sacco, Mr. Henry J. Davila and Mr. George Camejo attended Environmental Protection Agency, Air Pollution training, "Visible Emissions Evaluation," Orlando, Florida on February 17, 1973.

Mr. Eugene J. Sacco attended Environmental Protection Agency Air Pollution training, "Air Pollution Meteorology" course #411 at Research Triangle Park, North Carolina, March 6-10, 1972.

Mr. Eugene J. Sacco attended Environmental Protection Agency Air Pollution Training, "Diffusion of Air Pollution-Theory and Application," course #423 at Research Triangle Park, North Carolina, May 22-26, 1972.

Mr. Eugene J. Sacco, Mr. Henry J. Davila and Mr. George Camejo attended Environmental Protection Agency, Air Pollution Training "Visible Emissions Evaluation", short course in Orlando, Florida July 13, 1972.

Mr. Henry J. Davila attended Environmental Protection Agency Air Pollution Training, "Air Pollution Control Technology," course #431 at Research Triangle Park, North Carolina August 28 - September 1, 1972.

Mr. Eugene J. Sacco, Mr. George Camejo and Mrs. Shirley Field attended Environmental Protection Agency, Air Pollution Training "Visible Emissions Evaluation." short course in Riviera Beach, Florida on September 20, 1972.

V.

EQUIPMENT ACQUISITION

The major items purchased during the reporting period are as follows:

1. A thirty (30) - foot travel -type trailer (air monitoring lab).
2. A centrally controlled digital data acquisition system.
3. A meteorological Monitoring station. (wind direction, wind speed, temperature, and relative humidity).
4. A catwalk and tower for installation of meteorological station.
5. A norgren air dryer.
6. Twelve (12) dustfall bucket stands.
7. Eight (8) high-volume air sampler shelters.
8. One (1) high-volume sampler.



VI.

ENGINEERING EVALUATIONS

During the report period the program reviewed numerous engineering matters and acted on the same. A brief discussion of the principal matters considered follows:

1. In the month of April, this agency forwarded, under its own letterhead, a form letter prepared by the Department of Pollution Control requesting a compliance schedule and emergency episode plan of major sources of air pollution. Such action was taken in an effort to assist the **Regional Engineer** with a Department Directive contained in a State memorandum dated March 1, 1972. On the basis of the criteria established in the memorandum the following sources received a request from our agency:

The Quaker Oats Company  
Florida Power & Light Company  
Gulf & Western Food Products Company  
Atlantic Sugar Corporation  
Dixie Asphalt Company  
Osceola Farms Company  
Talisman Sugar Corporation  
Glades County Sugar Growers Cooperative Assn.  
Pratt & Whitney Aircraft  
Florida Sugar Corporation  
United States Sugar Corporation  
Rubin Construction Company

Replies were received from all above sources with the single exception of Rubin Construction Company. This source had recently completed a new

Engineering Evaluations (Cont.)

asphalt batching plant and had not yet conducted the necessary testing to develop a compliance schedule and emergency episode plan. The majority of the balance of the establishments inadequately replied<sup>to</sup> this agency's request. Most sources addressed their reply to the emergency episode plan. This agency<sup>has</sup> spent a considerable amount of time assisting the source's consulting engineers in the draft of the plans.

2. Pursuant to limitation on new sources of emissions in Palm Beach County imposed by the Florida Air Implementation Plan this Agency reviewed the operating levels at two sugar cane processing mills in Palm Beach County (Gulf & Western's Okeelanta Mill and Sugar Cane Growers Cooperative Mills). This review was necessary in order to determine the feasibility of installing one bunker "C" fuel oil feed of 180,000 lbs of steam/hour boilers at each mill and through an increase in the bagasse/bunker "C" fuel oil ratio at other boilers not significantly increase the overall sulfur dioxide emissions. The study demonstrated the feasibility of such<sup>a</sup> proposal. In cooperation with representatives of this agency the mill's engineers drafted forms for reports of fuel utilization steam generation and analyses of bunker "C" fuel oil and bagasse residue, for this agency's and the Department of Pollution Control's use in determining compliance with the terms of limitations imposed.
3. On May 10, 1972, F. J. Gargiulo attended a meeting in Tallahassee wherein representatives of the Florida Sugar Cane League, Inc. explained to the Department Personnel the performance of various pilot plant collectors tested by the industry prior to the installation of full scale devices. Of special interest to this Agency were three of the five particulate

### Engineering Evaluations (Cont.)

collectors described which, incidentally, were observed in operation by representatives of this agency. A summary of the industry's report of these follows:

Control Equipment	General Description	Total Insoluble Particulate Efficiency	Testing Location
Mickro/Aireton	Full Scale Medium High Energy Cyclonic Scrubber	97%	U. S. Sugar Corp. Clewiston, Florida
Joy Manufac- turing	Pilot Plant Medium - High Energy Static Bath Impingement Scrubber	87%	Sugar Cane Growers Coopera- tive Belle Glade, Florida
Zurn Manufac- turing	Pilot Plant Medium Energy Static Bath Impingement Scrubber	91%	Sugar Cane Growers Coopera- tive Belle Glade, Florida

Although the Mickro/Aireton showed a high apparent collection, efficiency representatives of this agency had previously witnessed excessive nozzle wear and noted the apparent lack of sulfur dioxide removal capability.

Likewise, pilot plant testing of the unit built by Zurn Manufacturing revealed that although it can function with a relatively high collection efficiency, its operational problems would far offset this apparent advantage. This agency was in agreement with the industry's selection of



## Engineering Evaluations (Cont.)

the Joy Manufacturing unit as the device for full scale testing.

4. At the request of the Sugar Cane League Inc. representatives of this agency witnessed numerous in-house stack test of pilot plant and full scale control devices at various times throughout the year. Extensive advise was made available to mill personnel regarding methods.
5. Control of fugitive particulates requirements in the newly enacted Chapter 17-2 F.A.C. prompted this agency to draft a comprehensive inspection form to be utilized in connection with cement handling concrete batching and asphalt batching facilities. This form is designed not only to examine site conditions, equipment conditions and general plant house-keeping but also certain plant features which have potential for fugitive particulate control. These include but are not limited to site paving and drainage, aggregate containment, materials transport and truck washing facilities. Twenty two (22) plants were inspected utilizing these forms and after some practical modifications of the same, specific recommendations for implementation of improvements were discussed with owners of fourteen of these plants (as of the closing date of this report period).
6. In September of this reporting year representatives of this agency witnessed the operation of a pathological incinerator operated at Brevard County General Hospital in Melbourne, Florida for the purpose of determining its performance. Such action was necessary pursuant to an application for a permit to install a similar unit at Doctors Hospital in Lake Worth, Florida and the unavailability of data of record on this

Engineering Evaluation (Cont.)

relatively inovative design.

7. During the course of the reporting year, the program received and acted on four (4) Permit Applications to Construct Air Pollution Sources and two (2) Applications to Operate Air Pollution Sources and two (2) Applications to Construct Incinerators. Completed forms and specific recommendations regarding final disposition of each were forwarded to the Department's Regional Engineer at periodic intervals.

VII.  
PUBLIC RELATIONS

The past year has been one of increased effort to make both state and local public officials in addition to the general public more cognizant of county air pollution problems and the overall County Air Pollution Program. Some of the more significant efforts were as follows:

1. All personnel of this agency attended parts of the Air Pollution <sup>Convention</sup> Control Association. Mr. J. H. Cooper was the Chairman of the facilities committee. Mr. E. J. Sacco and Mr. H. J. Davila participated in the tasks assigned to the facilities committee. The convention was held during the week of June 18 to June 22 at the Hotel Fontainebleau in Miami Beach, Florida.
2. The opening ceremonies and inspection of the Palm Beach County Health Department's Air Monitoring Laboratory were conducted at the West Palm Beach site during the month of October. The laboratory is housed in a 30 foot trailer. The ceremony was conducted by Mr. J. H. Cooper of the Palm Beach County Health Department. Welcoming remarks were delivered by Mr. Robert F. Culpepper, Chairman of the Palm Beach County Environmental Control Board.  
  
Members of the Tuberculosis and Respiratory Disease Association, Palm Beach County Health Department and news media attended.
3. Mr. J. H. Cooper addressed the Florida Engineering Society on the



role of an Air Pollution Program.

4. Mr. J. H. Cooper attended meetings as a member of the Clean Air Committee sponsored by the Tuberculosis and Respiratory Disease Association.
5. Mr. H. J. Davila attended a orientation workshop conducted by the State Department of Health and Rehabilitation Services in Jacksonville, Florida.
6. Mr. F. J. Gargiulo appeared before the Board of County Commissioners in order to explain Air Pollution Program fiscal matters.
7. Mrs. L. M. Field paraphrased the Florida Air Implementation Plan for use by the local Tuberculosis and Respiratory Disease Association.
8. The Palm Beach County Health Department has established a position designated Assistant Administrator - Community Relations. The position is held by Mr. J. Dorn who directs much of his time towards making public officials and the general public more aware of air pollution problems.

VIII.  
S U R V E I L L A N C E & E N F O R C E M E N T

Many important changes were made to Air Pollution Control regulations during the period from January 1 to December 31, 1972. Among these were changes to both state and local regulations.

The State Department of Air and Water Pollution Control underwent a significant revamping which included a change in nomenclature to the Department of Pollution Control. Chapters 17-2, Air Pollution, and 17-4, Permits, were completely rewritten to reflect changes in enforcement priorities and technological advances. In addition, the Board of Palm Beach County Commissioners passed an amendment to the Palm Beach County Environmental Control ordinance number 70-5. The Amendment altered the ordinance so that it would adopt by reference all state pollution control laws other than those dealing with permitting at the state level. This amendment has significantly broadened the enforcement powers of this agency on a local level.

This agency feels that the aforementioned changes have provided the Air Pollution Section with significant tools that can be employed in our enforcement efforts throughout Palm Beach County. The result will be an improvement in air quality once the public becomes more cognizant of the new enforcement procedures.

In order to monitor the compliance of Air Pollution rules our ground and aerial surveillance programs continued through the past year.

## Surveillance & Enforcement (Cont)

Twenty-nine (29) aerial surveillance missions of approximately two (2) hours each were flown this year. The majority of the missions were flown during the winter season. A total of ninety-eight open burning violations; twenty-four (24) were sugar cane fires; thirty-three (33) were land clearing fires; ten (10) were range fires; twenty-nine (29) were fires observed in dumps; and two (2) were vegetable field fires. The majority of the land clearing violations and fires observed ~~the dumps~~ were processed in accordance with local directives. Information concerning the other violations <sup>was</sup> ~~were~~ forwarded to the State of Florida, Department of Pollution Control, with affidavits designating the legal description of the acreage, date and time violation was recorded and name of property owner. State authorities then took appropriate action. It should be noted at this time that after several citations were issued to the sugar cane violators by State authorities a meeting was held in the Department of Pollution Control's Regional Engineer's office in Fort Lauderdale. At that time members of the sugar industry requested that no further citations be issued until they could implement proper procedures in order to comply with Chapter 17-5, Open Burning and Frost Protection Fires. The result was the appointment of Director of Environmental Affairs within the Florida Sugar Cane League. One of the director's primary responsibilities was to assure that sugar cane harvesting personnel burn their crops only during the hours prescribed in Chapter 17-5. In addition, that burning of sugar cane could only be conducted on days when the stagnation index was six (6) or less as computed by the Division of Forestry.

It should also be noted at this time that the above procedure has been reasonably successful. There has been a sharp decline in sugar cane violations



## Section VIII

### Surveillance & Enforcement (Cont.)

thus far this harvesting season (1972-1973). Cooperation of this type will certainly result in better air quality in the future throughout Palm Beach County.

Ground surveillance efforts were conducted in accordance with established procedures. Registered air pollution sources were constantly observed on a routine basis. Further, the inspectors were continually on the look-out for new and/or unpermitted sources. In addition, the inspectors were able to observe and investigate violations of other Air Pollution regulations, such as open burning.

Our agency feels that our ground and aerial surveillance procedures are substantial. Both programs will continue as long as funding is made available.

Formal enforcement action in which this agency has been involved during the report period include:

1. Formal notice of violation of the Palm Beach County Environmental Control Ordinance 70-5, as amended, section 2, chapter 17-5.08 was served on Palm Beach Auto Wrecking on October 25, 1972. The violation cited concerned the open burning of auto bodies and miscellaneous debris. Palm Beach Auto Wrecking had been cited in the past for similar violations.
2. Formal notice of violation of the Palm Beach County Environmental Control Ordinance 70-5, as amended section 2, chapter 17-5.08 was served on Cleary Brothers Construction Company on November 14, 1972. The violation cited concerned open burning of creosoted lumber and miscellaneous debris on the premise of the company yard.

## Section VIII

### Surveillance & Enforcement (Cont.)

3. Twenty-five (25) formal notices of violations of Chapter 17-5, F.A.C., were forwarded to the State of Florida, Department of Pollution Control for appropriate action.

Most sources through<sup>out</sup> the county<sup>are</sup> now reaching a full awareness of the scope of the Air Pollution Control Regulations affecting their operations and are making efforts to comply with said regulations. This agency feels that the small number of abative action cases which were necessary during the report period can be attributed to the increasing awareness and understanding of environmental regulations by sources and the public in general.

On June 9, 1972, informal notice of violation of Chapter 17-4.03 (1), F.A.C. was served on Snow Concrete Corporation. The violation concerned the lack of submittal of properly executed application forms for permit to construct for the Snow Concrete Corporation cement batching plant in Delray Beach, Florida. Properly executed forms were subsequently received and reviewed by this agency.

On September 7, 1972, informal notice of violation of Chapter 17-5.07 (1) (A) F.A.C. was served on the Murphy Construction Company. The violation concerned open burning of land clearing debris at times other than those allowed in Chapter 17-5. A conference was held with Mr. Luigi Morrel of the Murphy Construction Company on September 15, 1972 to clarify the provisions of the law.

On October 30, 1972, informal notice of violation of Chapter 17-5.07 (1) (a) F.A.C. was served on Florida Pnevumatic Manufacturing Corporation. The violation concerned open burning of land clearing debris at times other than those

Section VIII

Surveillance & Enforcement (Cont.)

allowed in Chapter 17-5. Further, the open burning operation also violated section 17-5.07 (3) (b) due to the observed density of the emitted smoke. No subsequent violations were observed.



## IX.

### TECHNICAL STUDIES

#### INTRODUCTION

The following routine analyses were performed during the reporting period.

#### Suspended Particulate (Daily/Monthly)

Total Gravimetric

Benzene Soluble Organics

Sulfates

Nitrates

#### Dustfall (Monthly)

Combustion Loss

Soluble

Insoluble

#### Microscopic Morphology

Ambient air sampling for suspended particulate matter at the twelve permanent monitoring stations, dustfall, and microscopic morphology of dustfall samples have continued as described in previous annual reports.

Gaseous sampling for total oxidants, nitrogen dioxide, sulfur dioxide, carbon monoxide and total hydrocarbons has been continued as described. Data for measured pollutant levels is presented in this report.

Further details on major technical studies are provided below.

#### PERMANENT MONITORING NETWORK

Palm Beach County's permanent monitoring network, as described in previous reports has been expanded to include a north-south intercept line to the west of the high

density population along the eastern seaboard. This line will provide historical data relating to the effects on the area as westward development of the area continues.

Tabulated results for suspended particulate and dustfall for the year 1972 are reported in tables 4, 5 and 6. The range of probable logarithmic values, total suspended particulate, 1971 and 1972 are presented in Graph 1, Tables 7, 8 and 9 summarized annual totals reported for these parameters for the years 1969 - 1972 . Geometric means of all stations are related to the Southeast Florida Ambient Air Standards in Table 10.

#### GASEOUS MONITORING

Gaseous monitoring during the report period was restricted to sampling periods at North Palm Beach, West Palm Beach and Boca Raton. Installation of the continuous monitoring equipment and incorporation of the data aquisition system reduced the availability of the equipment. All gaseous monitoring equipment is now installed in a permanent station located in West Palm Beach.

Data recorded at the three sites is presented in the following Tables:

Pollutant	Table
Total Oxidants	11
Nitrogen Dioxide	12
Sulfur Dioxide	13
Carbon Monoxide	14
Total Hydrocarbons	15

Historical data for these pollutants at all monitoring sites in the County is presented in Table 17. Table 16 relates measured values of these pollutants to the Southeast Florida Standards.

## Special Studies

SO<sub>2</sub> Two additional SO<sub>2</sub> monitoring stations were established in the western section of the County to record pollutant levels during the cane processing season. Two (2) scientific industry's SO<sub>2</sub> Analyzer-Recorders, set to measured ten minutes samples, have been used in this work. Location of these sites is indicated on the map of the County (Exhibit 1) tabulated results of measured pollutant levels is presented in Tables 18 and 19.



TABLE 4  
TOTAL SUSPENDED PARTICULATES - 1972

LOCATION	J	F	M	A	NUMBER OF SAMPLES				S	O	N	D	TOTAL	MAX	CONCENTRATION ug/M <sup>3</sup>			
					M	J	J	A							MIN	A. MEAN	G. MEAN	SG.
Tequesta	9	7	8	7	6	7	7	8	7	8	4	8	86	112.3	12.2	33.0	30.3	1.48
North Palm Beach	9	7	8	7	8	7	7	8	6	8	7	8	90	94.8	12.8	37.0	33.7	1.49
West Palm Beach	8	7	8	5	6	6	6	7	7	7	6	9	82	133.6	15.2	49.6	45.9	1.49
Lake Worth	9	7	8	7	8	7	6	8	7	8	7	8	90	89.8	12.9	34.8	32.3	1.49
Delray Beach	9	7	8	7	8	5	8	8	7	8	7	8	90	108.0	15.9	38.5	35.4	1.49
Boca Raton	8	7	8	6	7	7	8	8	7	8	7	6	87	275.3	17.0	44.9	39.9	1.56
Royal Palm Beach	9	7	7	5	8	7	8	8	7	8	6	8	87	102.0	7.0	31.8	28.3	1.37
Belle Glade	9	7	8	7	8	7	8	8	7	8	7	8	92	173.3	19.8	58.6	52.3	1.60
Grammercy Park	3	7	8	7	8	6	8	8	7	8	6	3	85	74.5	13.3	31.2	28.7	1.42
SW. F.D.	3	7	8	6	8	7	7	8	7	8	7	8	78	94.8	18.3	44.4	41.6	1.43
St. Vincent	3	7	8	7	8	7	8	8	7	8	6	8	85	69.9	11.9	32.1	29.2	1.51
Marymount	3	7	6	7	8	7	7	6	7	8	7	7	80	68.1	11.2	29.6	26.9	1.54

TABLE 5  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1972

LOCATION	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m <sup>3</sup>												
		J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
Tequesta	Total Suspended Particulates	29.4	32.6	37.7	28.7	38.7	43.7	35.3	36.0	26.2	27.5	28.1	30.8	33.0
	Organics, Benzene Soluble	1.01	2.28	0.91	0.55	0.38	1.48	1.18	1.30	0.77	0.23	1.24	1.21	1.04
	Sulfates	1.63	1.78	2.88	2.50	3.15	2.68	1.28	3.73	3.14	5.21	2.12	3.54	2.80
	Nitrates	0.59	0.79	1.41	0.87	0.71	0.08	0.78	0.64	0.56	0.68	0.67	0.55	0.75
North Palm Beach	Total Suspended Particulates	42.8	37.7	44.6	39.7	43.6	43.2	39.8	33.1	28.7	32.0	28.5	28.3	36.0
	Organics, Benzene Solubles	2.90	1.32	1.34	0.41	0.57	1.38	0.83	0.85	1.39	0.96	2.13	0.71	1.23
	Sulfates	2.26	1.75	4.32	2.64	3.20	3.42	1.47	2.96	3.13	5.99	2.78	3.65	3.13
	Nitrates	0.86	1.21	1.19	0.77	0.73	0.86	0.73	0.74	0.64	0.82	0.90	0.56	0.83
West Palm Beach	Total Suspended Particulates	52.4	60.0	56.7	66.3	49.8	53.5	44.0	35.5	42.7	46.9	40.1	49.2	49.6
	Organics, Benzene Soluble	3.08	2.99	3.24	1.04	1.89	3.13	1.43	1.57	2.40	2.12	3.17	2.15	2.35
	Sulfates	1.71	2.00	2.98	4.87	4.69	2.22	1.19	1.73	4.50	5.87	2.07	3.69	3.13
	Nitrates	0.75	0.97	1.19	2.20	1.06	1.11	0.52	0.64	0.43	0.64	0.79	0.42	0.89
Lake Worth	Total Suspended Particulates	30.7	47.6	44.7	32.9	43.1	41.6	37.5	34.2	29.2	32.2	26.7	31.6	34.8

TABLE 5 (CONT)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1972

LOCATION	ITEMS MEASURED	ARITHMETIC AVERAGES $\mu\text{g}/\text{m}^3$												TOTAL
		J	F	M	A	M	J	J	A	S	O	N	D	
Lake Worth	Organics, Benzene Soluble	1.13	2.39	1.46	0.09	1.96	1.28	1.51	0.83	0.63	1.06	1.13	1.20	1.22
	Sulfates	1.71	1.56	5.03	2.43	3.82	2.48	1.06	2.96	3.62	6.27	2.20	3.64	3.06
	Nitrates	0.86	1.22	1.09	0.72	0.82	0.83	0.60	0.45	0.47	0.66	0.60	0.47	0.73
Delray Beach	Total Suspended Particulates	33.6	39.0	52.1	35.4	43.7	52.0	43.7	39.2	27.3	32.0	29.5	37.2	38.5
	Organics, Benzene Soluble	1.70	0.62	1.46	0.63	0.88	0.61	0.44	0.90	0.69	0.98	1.77	1.19	0.99
	Sulfates	1.60	1.71	4.43	2.44	3.43	2.81	1.39	3.06	3.37	4.96	2.14	3.51	2.90
	Nitrates	0.80	1.30	1.21	0.76	0.84	0.97	0.69	0.67	0.45	0.56	0.71	0.52	0.79
Boca Raton	Total Suspended Particulates	68.0	52.1	53.7	36.4	50.5	42.7	46.5	40.3	28.5	39.2	31.9	45.0	44.9
	Organics, Benzene Soluble	1.75	1.57	1.73	0.00	1.33	1.12	0.35	0.93	0.59	1.08	1.71	1.12	1.11
	Sulfates	1.82	3.91	4.90	3.05	4.86	2.24	2.34	1.70	3.87	6.09	2.85	2.97	3.38
	Nitrates	0.91	1.26	1.31	0.76	0.93	0.86	0.80	0.43	0.48	0.59	0.60	0.47	0.78
Royal Palm Beach	Total Suspended Particulates	22.7	27.6	30.5	32.2	37.2	38.0	45.2	32.3	24.8	28.6	23.2	23.0	31.8



TABLE 5 (CONT)

MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1972

LOCATION ITEMS MEASURED		ARITHMETIC AVERAGE ug/m <sup>3</sup>												
		J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
Royal Palm Beach	Organics, Benzene Soluble	1.49	0.25	1.10	1.14	0.26	0.62	1.22	0.90	0.91	0.53	0.76	0.71	0.82
	Sulfates	1.15	1.10	2.32	1.96	3.07	2.39	0.99	3.11	2.58	4.89	1.94	2.95	2.37
	Nitrates	0.71	1.31	1.27	1.13	0.69	0.85	0.85	0.68	0.49	0.71	0.65	0.54	0.82
Belle Glade	Total Suspended Particulates	61.5	84.8	80.8	53.9	56.7	40.8	53.6	54.0	37.3	62.2	50.1	63.5	58.6
	Organics, Benzene Solubles	3.13	1.50	3.03	2.47	1.46	1.34	1.81	1.04	2.00	2.33	2.95	1.43	2.04
	Sulfates	1.87	2.89	5.31	2.66	3.78	2.04	1.16	3.51	3.35	5.58	2.73	5.36	3.35
	Nitrates	0.89	1.54	1.71	1.50	0.92	0.84	0.92	0.76	0.79	1.08	0.92	0.95	1.07
Marrymount	Total Suspended Particulates	22.7	31.8	42.3	26.3	34.2	31.5	35.0	26.7	24.1	25.8	23.3	28.2	29.6
	Organics, Benzene Soluble	4.63	3.39	1.05	0.26	1.22	1.13	0.37	0.64	1.34	0.66	0.11	0.70	1.29
	Sulfates	0.83	1.93	4.03	3.11	3.55	2.07	0.57	2.35	4.35	5.22	2.21	3.10	2.78
	Nitrates	0.76	1.13	1.77	0.89	0.63	0.58	0.64	0.86	0.42	0.49	0.76	0.35	0.77
Saint Vincent	Total Suspended Particulates	23.6	31.1	37.4	29.3	43.7	40.2	34.4	30.4	24.8	28.1	26.8	28.0	32.1

TABLE 5 (CONT)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1972

LOCATION	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m <sup>3</sup>												TOTAL
		J	F	M	A	M	J	J	A	S	O	N	D	
St. Vincent	Organics, Benzene Soluble	2.45	0.74	1.12	0.28	2.04	1.07	1.36	0.80	0.94	1.57	0.94	0.72	1.17
	Sulfates	1.07	1.63	2.73	2.45	3.09	2.02	0.90	2.24	3.12	4.68	2.77	2.82	2.46
	Nitrates	0.77	1.29	1.25	0.88	0.66	1.18	0.66	0.60	0.42	0.55	1.13	0.73	0.84
Southwest Fire Department	Total Suspended Particulates	29.8	49.6	53.9	41.0	45.6	44.4	48.1	46.1	40.4	44.3	37.5	36.4	44.4
	Organics, Benzene Soluble	1.64	3.16	2.06	1.52	2.14	1.57	1.60	2.37	2.82	2.17	1.97	2.40	2.12
	Sulfates	0.57	2.31	3.23	3.21	3.40	2.46	1.01	3.22	4.04	5.91	2.42	3.12	2.91
	Nitrates	0.52	1.15	1.49	0.97	0.62	0.79	0.87	0.59	0.49	0.56	0.60	0.89	0.80
Grammercy Park	Total Suspended Particulates	18.2	29.0	37.2	28.2	34.1	38.9	39.8	34.6	26.9	27.3	25.9	25.8	31.2
	Organics, Benzene Solubles	7.28	0.74	0.74	0.14	1.03	0.59	1.53	0.64	1.08	1.50	1.49	0.24	1.42
	Sulfates	0.91	1.63	3.24	2.51	2.83	2.43	0.57	2.83	3.16	6.06	2.00	3.73	2.66
	Nitrates	1.30	1.29	1.39	0.82	0.83	0.72	0.70	0.52	0.48	0.49	0.67	0.53	0.81

TABLE 6  
ANNUAL DUSTFALL - 1972

LOCATION	NO. OF SAMPLES	TOTAL CONCENTRATIONS TONS/mi <sup>2</sup>			ARITHMETIC AVERAGE TONS/mi <sup>2</sup>		
		MAX	MIN	ARITH. AVERAGE	INSOL	SOL	COMB LOSS
Tequesta	8	22.16	4.60	9.34	3.90	5.58	2.23
North Palm Beach	10	23.28	3.21	8.78	2.51	5.16	1.95
West Palm Beach	10	19.93	6.69	11.43	4.18	6.83	2.09
Lake Worth	11	15.61	2.51	7.95	2.37	5.72	1.25
Delray Beach	11	11.71	1.39	6.55	2.09	4.60	0.84
Boca Raton	11	15.19	4.46	8.36	2.37	5.85	1.12
Royal Palm Beach	4	47.39	10.73	27.32	8.61	18.82	2.79
Belle Glade	12	18.26	5.99	9.62	4.88	4.46	1.95



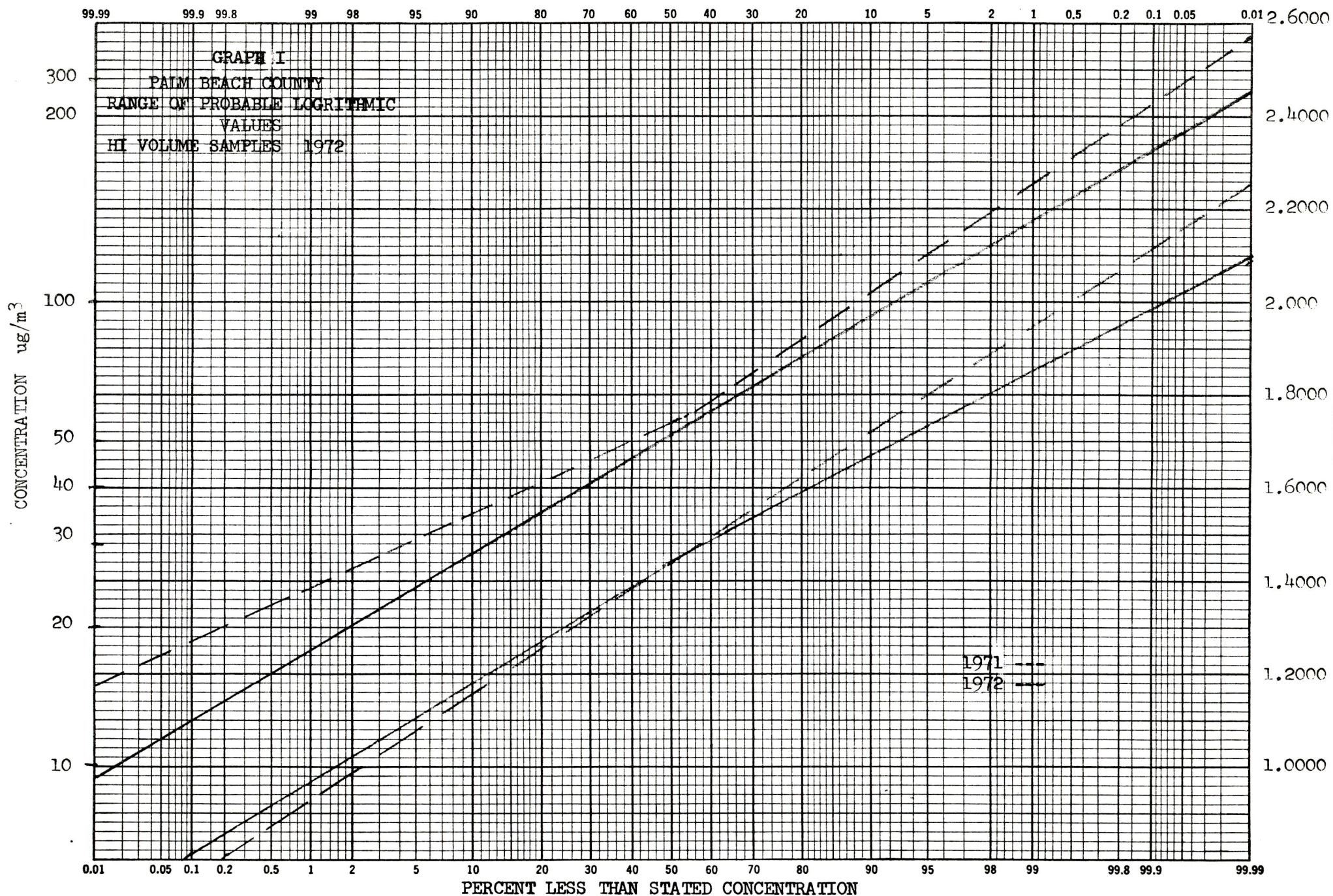




TABLE 7  
TOTAL SUSPENDED PARTICULATE ug/m<sup>3</sup>

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
Tequesta	Maximum	71.2	74.3	122.3	112.3
	Minimum	7.3	13.3	10.7	12.2
	Arithmetic Mean	26.9	30.4	34.6	33.0
	Geometric Mean	24.6	28.3	30.8	30.3
	Geometric Std. Deviation	1.51	1.45	1.61	1.48
North Palm Beach	Maximum	71.8	82.3	167.5	94.8
	Minimum	7.7	1.3	0.4	12.8
	Arithmetic Mean	32.2	31.7	40.6	37.0
	Geometric Mean	29.5	28.4	30.7	33.7
	Geometric Std. Deviation	1.63	1.76	2.93	1.49
West Palm Beach	Maximum	109.3	115.7	121.1	133.6
	Minimum	9.6	13.9	15.2	15.2
	Arithmetic Mean	48.7	40.9	58.7	49.9
	Geometric Mean	43.9	39.5	53.4	45.9
	Geometric Std. Deviation	1.56	1.42	1.19	1.49
Lake Worth	Maximum	351.9	224.8	95.6	89.8
	Minimum	7.3	8.0	10.2	12.9
	Arithmetic Mean	32.9	30.9	37.2	34.8
	Geometric Mean	26.4	28.2	31.7	32.3
	Geometric Std. Deviation	1.78	1.47	1.85	1.49
Delray Beach	Maximum	164.9	76.7	142.4	108.0
	Minimum	13.3	8.3	12.2	15.9
	Arithmetic Mean	40.1	36.2	36.4	38.5
	Geometric Mean	38.8	33.6	32.0	35.4
	Geometric Std. Deviation	1.47	1.49	1.64	1.49

TABLE 7 (CONT)  
TOTAL SUSPENDED PARTICULATE ug/m<sup>3</sup>

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
Boca Raton	Maximum	83.1	80.1	237.9	275.3
	Minimum	9.5	9.6	13.3	17.0
	Arithmetic Mean	36.4	33.5	49.1	44.9
	Geometric Mean	32.9	31.0	41.1	39.9
	Geometric Std. Deviation	1.60	1.48	2.09	1.56
Royal Palm Beach	Maximum	52.5	71.7	131.5	102.0
	Minimum	7.2	2.1	1.6	7.0
	Arithmetic Mean	23.6	25.8	30.7	31.8
	Geometric Mean	21.5	23.3	24.4	28.3
	Geometric Std. Deviation	1.57	1.59	2.13	
Belle Glade	Maximum	175.7	273.9	222.7	173.3
	Minimum	12.7	14.5	12.6	19.8
	Arithmetic Mean	53.8	54.6	61.4	58.6
	Geometric Mean	46.0	47.1	53.1	52.3
	Geometric Std. Deviation	1.76	1.70	1.64	1.60
Grammercy Park	Maximum				74.5
	Minimum				13.3
	Arithmetic Mean				31.2
	Geometric Mean				28.7
	Geometric Std. Deviation				1.42
Southwest Fire Department	Maximum				94.8
	Minimum				18.3
	Arithmetic Mean				44.4
	Geometric Mean				41.6
	Geometric Std. Deviation				1.43

TABLE 7 (CONT)  
TOTAL SUSPENDED PARTICULATE  $\mu\text{g}/\text{m}^3$

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
St. Vincent	Maximum				69.9
	Minimum				11.9
	Arithmetic Mean				32.1
	Geometric Mean				29.2
	Geometric Std. Deviation				1.51
Marymount	Maximum				68.1
	Minimum				11.2
	Arithmetic Mean				29.6
	Geometric Mean				26.9
	Geometric Std. Deviation				1.54



TABLE 8  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
Tequesta	Total Suspended Particulate	26.9	30.4	34.6	33.0
	Organics, Benzene Soluble	1.6	1.6	4.0	1.0
	Sulfates	3.6	4.2	3.2	3.5
	Nitrates	0.6	0.6	0.8	0.8
North Palm Beach	Total Suspended Particulate	32.2	31.7	40.6	37.0
	Organics, Benzene Soluble	3.9	4.4	4.8	1.2
	Sulfates	2.4	3.4	3.2	3.1
	Nitrates	0.7	0.7	0.9	0.8
West Palm Beach	Total Suspended Particulate	48.7	40.9	58.7	49.6
	Organics, Benzene Soluble	3.3	3.8	4.7	2.4
	Sulfates	4.1	3.2	3.6	3.7
	Nitrates	0.8	0.7	1.2	0.9
Lake Worth	Total Suspended Particulate	32.9	30.9	37.2	34.8
	Organics, Benzene Soluble	1.5	1.7	3.3	1.2
	Sulfates	3.3	3.2	3.1	3.6
	Nitrates	0.7	0.8	1.0	0.7
Delray Beach	Total Suspended Particulate	40.1	36.2	36.4	38.5
	Organics, Benzene Soluble	2.8	2.9	3.5	1.0
	Sulfates	3.9	4.1	2.8	3.5
	Nitrates	0.8	0.8	0.9	0.8
Boca Raton	Total Suspended Particulate	36.4	33.5	49.1	44.9
	Organic, Benzene Soluble	1.6	2.4	3.2	1.1
	Sulfates	3.9	3.2	2.9	3.0
	Nitrates	0.7	0.8	0.9	0.8

TABLE 8 (CONT)  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGE  $\mu\text{g}/\text{m}^3$

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
Royal Palm Beach	Total Suspended Particulate	23.6	25.8	30.7	31.8
	Organics, Benzene Soluble	1.6	2.3	4.2	0.8
	Sulfates	3.4	3.6	2.2	3.0
	Nitrates	0.7	0.8	0.9	0.8
Belle Glade	Total Suspended Particulate	53.8	54.6	61.4	58.6
	Organics, Benzene Soluble	2.8	3.6	5.6	2.0
	Sulfates	4.2	4.1	3.3	3.4
	Nitrates	0.8	1.0	1.2	1.1
Grammercy Park	Total Suspended Particulate				31.2
	Organics, Benzene Soluble				1.3
	Sulfates				2.8
	Nitrates				0.8
Southwest Fire Department	Total Suspended Particulate				44.4
	Organics, Benzene Soluble				1.2
	Sulfates				2.5
	Nitrates				0.8
St. Vincent	Total Suspended Particulate				32.1
	Organics, Benzene Soluble				2.1
	Sulfates				2.9
	Nitrates				0.8
Marymount	Total Suspended Particulate				29.6
	Organics, Benzene Soluble				1.4
	Sulfates				2.7
	Nitrates				0.8

TABLE 9  
ANNUAL DUSTFALL T/mi<sup>2</sup>

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
Tequesta	Arithmetic Mean	8.3	8.31	8.97	9.34
	Insoluble	2.5	3.95	4.30	3.90
	Soluble	5.8	4.36	4.70	5.58
	Comb. Loss	1.3	0.95	1.70	2.23
North Palm Beach	Arithmetic Mean	8.0	9.29	8.66	8.78
	Insoluble	2.2	2.52	4.51	2.51
	Soluble	5.8	6.77	4.07	5.16
	Comb. Loss	0.9	1.38	1.08	1.95
West Palm Beach	Arithmetic Mean	16.3	11.34	10.92	11.43
	Insoluble	0.7	5.26	5.28	4.18
	Soluble	9.6	6.08	5.94	6.83
	Comb. Loss	2.4	1.93	2.26	2.09
Lake Worth	Arithmetic Mean	10.1	8.96	10.44	7.95
	Insoluble	3.2	3.24	5.85	2.37
	Soluble	6.9	5.71	4.59	5.72
	Comb. Loss	1.7	0.82	2.20	1.25
Delray Beach	Arithmetic Mean	12.0	10.05	6.24	6.55
	Insoluble	4.3	3.12	2.82	2.09
	Soluble	7.7	6.62	3.43	4.60
	Comb. Loss	2.0	1.27	1.39	0.84
Boca Raton	Arithmetic Mean	8.7	9.27	8.69	8.36
	Insoluble	3.2	3.01	3.89	2.37
	Soluble	5.5	6.26	4.75	5.85
	Comb. Loss	1.3	1.01	1.42	1.12

TABLE 9 (CONT)  
ANNUAL DUSTFALL T/mi<sup>2</sup>

STATION	PARAMETER	YEAR			
		1969	1970	1971	1972
Royal Palm Beach	Arithmetic Mean	11.3	19.99	21.56	27.32
	Insoluble	5.0	7.86	7.94	8.61
	Soluble	6.3	12.13	13.61	18.82
	Comb. Loss	1.1	2.96	1.46	2.79
Belle Glade	Arithmetic Mean	10.5	11.30	9.88	9.62
	Insoluble	5.1	5.96	5.94	4.88
	Soluble	5.4	5.34	3.94	4.46
	Comb. Loss	2.0	2.32	2.15	1.95



TABLE 10

AMBIENT AIR QUALITY STANDARD -  
SOUTH EAST FLORIDA AIR QUALITY REGION  
1972

## SUSPENDED PARTICULATE

AIR QUALITY STANDARD	ANNUAL GEOMETRIC MEAN 50	MAXIMUM 24 HOUR CONCENTRATION 180
Tequesta	30.3	112.3
North Palm Beach	33.7	94.8
West Palm Beach	45.9	133.6
Lake Worth	32.3	89.8
Delray Beach	35.4	108.0
Boca Raton	39.9	275.3
Royal Palm Beach	28.3	120.0
Belle Glade	52.3	173.3
Marymount	26.9	68.1
St. Vincent de Paul	29.2	69.9
Southwest Fire Dept	41.6	94.8
Grammercy Park	28.7	74.5

TABLE 11  
 AMBIENT AIR TOTAL OXIDANTS - 1972

	NORTH PALM BEACH	BOCA RATON	WEST PALM BEACH	COMPOSITE		
				TOTAL MINUTES	%	CUM %
1 Hr. Maximum	0.116	0.050	>0.187			
8 Hr. Maximum	0.071	0.027	>0.040			
<u>CONCENTRATION</u>						
42 <0.010	27660	2490	12570	42720	39.19	39.19
0.010-0.019	6255	10815	22200	39270	36.02	75.21
0.020-0.029	3345	6360	9375	19080	17.50	92.71
0.030-0.039	2400	360	2700	5460	5.01	97.72
0.040-0.049	705	30	360	1095	1.00	98.72
0.050-0.059	750	30	30	810	0.74	99.46
0.060-0.069	150	30	15	195	0.18	99.64
0.070-0.079	60			60	0.06	99.70
0.080-0.089	135			135	0.12	99.82
0.090-0.099	105		15	120	0.11	99.93
>0.100	45		30	75	0.07	100.00
<u>TOTAL</u>	41610	20115	47295	109020		
<u>DOWNTIME</u>						
Auto Baseline	6015	2850	6720	15585		
Routine Maint.	1185	345	1620	3150		
Mechanical Break-						
down	11235	14490	6165	31890		
Operator Error	1500	780	4380	6660		
Dynatronics			1875	1875		
<u>TOTAL</u>	19935	18465	20760	59160		
<u>TOTAL TIME AT</u>						
<u>SITE</u>	61545	38580	68055	168180		

TABLE 12  
AMBIENT AIR - NO<sub>2</sub>  
1972

	NORTH PALM BEACH	BOCA RATON	WEST PALM BEACH	COMPOSITE		
				TOTAL MINUTES	%	CUM %
1 Hr. Maximum	0.088	0.065	0.092			
8 Hr. Maximum	0.059	0.055	0.079			
Arithmetic Mean	0.010	0.011	0.020			
<u>CONCENTRATION</u>						
0.002 ppm		675	75	750	.55	.55
0.006 - 0.005	1695	7845	7785	17325	12.61	13.15
0.006 - 0.009	22815	11130	11025	44970	32.72	45.87
0.010 - 0.019	14055	8715	16440	39210	28.53	74.41
0.020 - 0.029	7275	2565	7560	17400	12.66	87.07
0.030 - 0.039	3900	1470	4005	9375	6.82	93.89
0.040 - 0.049	1650	510	2520	4680	3.41	97.29
0.050 - 0.059	765	210	1215	2190	1.59	98.89
0.060 - 0.069	210	135	465	810	0.59	99.48
0.070 - 0.079	90		180	270	0.20	99.67
0.080 - 0.089	135		150	285	0.21	99.88
0.090 - 0.099	45		60	105	0.08	99.96
0.100 - 0.149	60			60	0.04	100.00
0.150 - 0.199						
0.200						
<u>TOTAL</u>	52695	33255	51480	137430		
<u>DOWNTIME</u>						
Auto Baseline	7530	4770	7350	19650		
Routine Maint.	1110	555	1080	2745		
Mechanical Break-						
down	390	0	6375	6765		
Operator Error	90	0	0	90		
Dynatronics	0	0	1815	1815		
<u>TOTAL</u>	9120	5325	16620	31065		
<u>TOTAL TIME AT</u>	61815	38580	68100	168495		
<u>SITE</u>						

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TABLE 13  
AMBIENT AIR - SO<sub>2</sub>  
1972

	NORTH PALM BEACH	BOCA RATON	WEST PALM BEACH	COMPOSITE		
				TOTAL MINUTES	%	CUM %
1 Hr. Maximum ppm	0.053	0.015	0.023			
4 Hr. Maximum ppm	0.024	0.012	0.017			
24 Hr. Maximum ppm	0.006	0.003	0.003			
Arithmetic Mean	0.0005	0.0001	0.0002			
<u>CONCENTRATION</u>	<u>MINUTES</u>	<u>MINUTES</u>	<u>MINUTES</u>			
<0.010 ppm	49695	33030	47355	130080	98.80	98.80
0.010 - 0.019	285	210	360	855	0.65	99.45
0.020 - 0.029	315	45	105	465	0.35	99.81
0.030 - 0.039	120			120	0.09	99.90
0.040 - 0.049	60			60	0.05	99.94
0.050 - 0.059	45			45	0.03	99.98
0.060 - 0.069	30			30	0.03	100.00
0.070 - 0.079						
0.080 - 0.089						
0.090 - 0.099						
0.100						
<u>TOTAL</u>	50550	33285	47820	131655		
<u>DOWNTIME</u>						
Auto Baseline	7140	4740	6780	18660		
Routine Maint.	1230	555	1440	3225		
Mechanical Break-						
down	2415	0	3330	5745		
Operator Error	480	0	6975	7455		
Dynatronics	0	0	1755	1755		
<u>TOTAL</u>	11265	5295	20280	36840		
<u>TOTAL TIME AT</u>						
<u>SITE</u>	61815	38580	68100	168495		



TABLE 14  
 AMBIENT AIR - CARBON MONOXIDE  
 1972

	NORTH PALM BEACH	WEST PALM BEACH	TOTAL MINUTES	%	CUM %
1 Hr. Maximum	≤2.0	7.0			
8 Hr. Maximum	≤2.0	3.7			
<u>CONCENTRATION RANGE</u>					
≤2.0	15600	53010	68610	96.58	96.58
2.0 - 2.4		960	960	1.35	97.93
2.5 - 2.9		330	330	0.46	98.40
3.0 - 3.9		660	660	0.93	99.32
4.0 - 4.9		180	180	0.25	99.58
5.0 - 5.9		210	210	0.30	99.87
6.0 - 6.9		30	30	0.04	99.92
7.0 - 7.9		30	30	0.04	99.96
8.0 - 8.9		30	30	0.04	100.00
9.0 - 9.9					
≥10.0					
<u>TOTAL</u>	15600	55440	71040		
<u>DOWNTIME</u>					
Routine Maint.	100	300	400		
Mechanical Breakdown	10720	18270	28990		
Operator Error		3150	3150		
Dynatronics		41880	41880		
<u>TOTAL</u>	10820	63600	74420		
<u>TOTAL TIME AT SITE</u>	26420	119040	145460		

TABLE 15  
 AMBIENT AIR - HYDROCARBONS  
 1972

	NORTH PALM BEACH	WEST PALM BEACH	COMPOSITE		
			TOTAL MINUTES	%	CUM %
1 Hr. Maximum	3.2	6.5			
8 Hr. Maximum	2.2	3.2			
<u>CONCENTRATION RANGE</u>					
94	<0.1	320	320	0.47	0.47
	0.1 - 0.5	210	840	1.22	1.69
	0.6 - 1.0	440	21110	30.70	32.38
	1.1 - 1.5	7010	29270	42.56	74.95
	1.6 - 2.0	7400	12590	18.31	93.25
	2.1 - 2.5	1540	2920	4.25	97.50
	2.6 - 3.0	160	730	1.06	98.56
	3.1 - 3.5	60	390	0.57	99.13
	3.6 - 4.0	10	100	0.15	99.27
	4.1 - 4.5	50	350	0.51	99.78
	4.6 - 5.0	60	60	0.09	99.87
	5.1 - 5.5	0	0	0	0
	5.6 - 6.0	60	60	0.09	99.96
	6.1 - 6.5	0	0	0	
	6.6 - 7.0	30	30	0.04	100.00
<u>TOTAL</u>	17200	51570	68770		
<u>DOWNTIME</u>					
Routine Maintenance	320	5790	6110		
Mechanical Breakdown	18530	16590	35120		
Operator Error	0	3150	3150		
Dynatronics	0	41880	41880		
<u>TOTAL</u>	18850	67410	86260		
<u>TOTAL TIME AT SITE</u>	36050	118980	155030		

TABLE 16  
 AMBIENT AIR QUALITY STANDARDS  
 SOUTH EAST FLORIDA AIR QUALITY REGION

LOCATION	ANNUAL ARITHMETIC MEAN	SULFUR DIOXIDE			CARBON MONOXIDE		PHOTOCHEMICAL OXIDANTS	NITROGEN DIOXIDE
		MAXIMUM 24 HOUR CONCN.	MAXIMUM 4 HOUR CONCN.	MAXIMUM 1 HOUR CONCN.	MAXIMUM 8 HOUR CONCN.	MAXIMUM 1 HOUR CONCN.	MAXIMUM 1 HOUR CONCN.	ANNUAL ARITHMETIC MEAN
Standard	0.003	0.010	0.020	0.100	8	12	0.08	0.05
North Palm Beach	0.0005	0.006	0.024	0.053	< 2.0	< 2.0	0.12*	0.01
47 Boca Raton	0.0001	0.003	0.012	0.015			0.05*	0.01
West Palm Beach	0.0002	0.003	0.017	0.023	3.7	7.0	0.19*	0.02

\* TOTAL OXIDANTS

ALL CONCN. EXPRESSED IN ppm

TABLE 17  
MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.

LOCATION	SAMPLING DATA	SULFUR DIOXIDE				TOTAL OXIDANTS	
		1 HOUR	4 HOUR	24 HOUR	AR/MEAN	1 HOUR	8 HOUR
Tequesta	6/16-7/2/70	0.035	0.025	0.010	0.0007	0.104	0.093
	5/11-5/25/71	0.191	0.120	0.028	0.0021	0.010	0.0004
	8/13-8/27/71	0.033	0.011	0.003	0.0002	0.016	0.018
North Palm Beach	7/2-7/17/70	0.196	0.097	0.028	0.0052	0.176	0.086
	4/27-5/11/71	>0.500	>0.293	0.060	0.0060	0.111	0.055
	7/30-8/13/71	0.064	0.031	0.005	0.0005	0.007	0.001
		0.053	0.024	0.006	0.0005	0.116	0.071
West Palm Beach	7/17-7/31/70	0.094	0.032	0.007	0.0020	0.114	0.073
	4/12-4/27/71	0.044	0.029	>0.006	0.0005	>0.188	>0.130
	7/16-7/30/71	0.035	0.009	0.002	0.0001	0.032	0.026
		0.023	0.017	0.003	0.0002	>0.187	>0.040
Lake Worth	7/31-8/14/70	0.031	0.024	0.010	0.002	0.129	0.089
	3/26-4/12/71	0.044	>0.027	0.012	0.0022	0.110	0.106
	9/23-10/4/71	0.080	0.025	0.006	0.0011	0.056	0.048
	11/10-11/19/71	0.000	0.000	0.000	0.0000	0.078	0.073
Boca Raton	8/21-9/4/70	0.076	0.044	0.013	0.0010	0.048	0.037
	1/27-2/12/71	0.132	0.087	0.017	0.0032	0.110	0.095
	12/29-1/12/72	0.068	0.034	0.006	0.0007	0.000	0.000
		0.015	0.012	0.003	0.0001	0.050	0.027
Delray Beach	9/4-9/18/70	0.069	0.021	0.003	0.0003	0.092	0.066
	3/12-3/26/71	0.060	0.026	0.005	0.0008	0.013	0.086
	10/19-11/1/71	0.006	0.002	0.0003	<0.0001	0.136	0.101
Royal Palm Beach	9/28-10/12/70	0.106	0.036	0.006	0.002	0.076	0.068
	2/26-3/12/71	0.026	>0.007	>0.003	0.0002	0.110	0.093
	11/19-12/10/71	0.015	0.005	0.001	0.0001	0.038	0.016
Belle Glade	10/12-10/26/70	0.000	0.000	0.000	0.000	0.078	0.061
	2/12-2/26/71	>0.288	>0.122	>0.030	0.0040	0.103	0.076
	2/10-12/29/71	>0.267	>0.187	>0.039	0.0106	0.012	0.006



TABLE 17 (CONT)  
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.

LOCATION	SAMPLING DATES	NO <sub>2</sub>			CO		HC	
		1 HOUR	8 HOUR	AR./MEAN	1 HOUR	8 HOUR	1 HOUR	8 HOUR
Tequesta	6/16-7/2/70	0.044	0.032	0.010				
	5/11-5/25/71	0.054	0.040	0.013	2.2	0.3		
	8/13-8/27/71	0.073	0.060	0.013	0.0	0.0		
North Palm Beach	7/2-7/17/70	0.084	0.060	0.019				
	4/27-5/11/71	0.096	0.066	0.017				
	7/30-8/13/71	0.083	0.069	0.018	3.2	0.9		
		0.088	0.059	0.010	0.0	0.0	3.2	2.2
West Palm Beach	7/17-7/31/70	0.097	0.068	0.016				
	4/12-4/27/71	0.147	0.079	0.026				
	7/16-7/30/71	0.067	0.056	0.018	3.6	3.1		
		0.092	0.079	0.020	7.0	3.7	6.5	3.2
Lake Worth	7/31-8/14/70	0.097	0.068	0.016				
	3/26-4/12/71	0.118	0.107	0.018	2.1	0.3		
	9/23-10/4/71	0.059	0.041	0.018	0.0	0.0		
	11/10-11/19/71	0.124	0.101	0.020	0.0	0.0		
Boca Raton	8/21-9/4/70	0.064	0.048	0.015				
	1/27-2/12/71	0.200	0.187	0.047	9.6	4.2		
	12/29-1/12/71	0.079	0.069	0.022	2.6	0.4		
		0.065	0.055	0.011				
Delray Beach	9/4-9/18/70	0.055	0.051	0.013				
	3/12-3/26/71	0.146	0.113	0.018	2.1	0.4		
	10/19-11/1/71	0.117	0.093	0.029				
Royal Palm Beach	9/28-10/12/70	0.031	0.018	0.007				
	2/26-3/12/71	0.106	0.081	0.016	0.8	0.1		
	11/9-12/10/71	0.074	0.055	0.019	2.2	2.0		
Belle Glade	10/12-10/26/70	0.118	0.067	0.017				
	2/12-2/26/71	0.152	0.091	0.022	5.2	3.0		
	12/10-12/29/71	0.076	0.048	0.024	0.0	0.0		

TABLE 18  
 AMBIENT AIR - SO<sub>2</sub> -  
 GLADES HEALTH DEPARTMENT

MINUTES			
	12/1 - 12/31/72	%	CUM %
1 Hour Maximum	0.013 ppm		
4 Hour Maximum	0.003 ppm		
24 Hour Maximum	0.001 ppm		
Arithmetic Mean	0.001 ppm		
<u>CONCENTRATION RANGE, PPM</u>			
<0.001			
0.001 - 0.005	33703	99.82	99.82
0.006 - 0.010			
0.011 - 0.015	60	0.18	100.00
<u>TOTAL</u>	33763		
<u>DOWNTIME</u>			
Routine Maintenance	24		
Mechanical Breakdown	0		
	10189		
Operator Error	0		
<u>TOTAL</u>	10213		
<u>TOTAL TIME AT SITE</u>	43976		

TABLE 19

AMBIENT AIR - SO<sub>2</sub>,  
GLADES OFFICE BUILDING

	MINUTES	MINUTES	MINUTES	MINUTES	COMPOSITE	
	9/21-9/30/72	10/1-10/31/72	11/1-11/30/72	12/1-12/31/72	Total Minutes %	CUM %
1 Hr. Maximum ppm	≤0.001	0.025	0.030	≤0.001		
4 Hr. Maximum ppm	≤0.001	0.019	0.009	≤0.001		
24 Hr. Maximum ppm	≤0.001	0.009	0.002	≤0.001		
Arithmetic Mean ppm	≤0.001	0.001	≤0.001	≤0.001		
<u>CONCENTRATION RANGE, PPM</u>						
≤0.001	9192	35020	30788	24273	99273	97.07 97.07
0.001 - 0.005		1080			1080	1.06 98.12
0.006 - 0.010		720			720	0.70 98.83
0.011 - 0.015		780	60		840	0.82 99.65
0.016 - 0.020		120	60		180	0.18 99.82
0.021 - 0.025		60	60		120	0.12 99.94
0.026 - 0.030			60		60	0.06 100.00
<u>TOTAL</u>	9192	37780	31028	24273	102273	
<u>DOWNTIME</u>						
Routine Maintenance	109	95	0		204	
Mechanical Breakdown	4206	0	0	10870	15076	
Operator Error	0	0	0	0	0	
Chart Out	38	6765	12172	9497	28472	
<u>TOTAL</u>	4353	6860	12172	20367	43753	
<u>TOTAL TIME AT SITE</u>	13545	44640	43200	44640	146025	

X.

EMISSION INVENTORY

INTRODUCTION

The emission inventory presented in this report represents the calculated emissions within the County for the 1972 calendar year. Individual pollutants, emission factors and methodology are as described in previous reports. Primary point emission sources and monitoring stations are located and identified in Exhibit I.

DISCUSSION & RESULTS

Transportation: Motor Vehicles: An overall reduction in calculated emissions in this category reflect an increase in the automotive population equipped with pollution control devices this is to a degree, counter-balanced by an increase in total automotive population.

Aircraft: Increased emissions from this source reflect increased air traffic within the County.

Locomotive: Increases within this category reflect increased locomotive traffic.

INDUSTRIAL

Steam Electric: The increased use of fuel oil for the generation steam electric power is reflected in the calculated emissions for this industry. Continued use of low sulfur fuel is responsible for the levels of SO<sub>2</sub> and SO<sub>3</sub> reported.

Aircraft: Emissions from this industry continue to be relatively stable.

Concrete Batching: The increased emissions from this source reflect a 27% increase in activity within this industry. This is related to the present and anticipated population growth for the county.

Asphalt Batching: Increases for this industry reflect activity in construction



in general and increased highway construction.

Sugar: Emissions for the sugar industry are directly related to increased production quotas.

Processing: Relative stability within this category is noted.

Solvent Emissions: Increases within this category reflect increases in overall population.

Refuse Disposal: Emissions from sources within this category reflect decreases in the number of incinerators operating within the county and continued control of open burning at land fill sites. Open burning of auto bodies is no longer a regularly practiced method of salvage.

Residential & Commercial Heating & Cooling: This category has remained relatively stable since the last report period.

TABLE 20  
SUMMARY OF AIR POLLUTION EMISSIONS  
IN PALM BEACH COUNTY  
1972 (T/YR.)

SOURCE	ALD	CO	HC	NO <sub>2</sub>	SO <sub>2</sub>	SO <sub>3</sub>	HAC	PART	TOTAL	%
TRANSPORTATION	415	127874	22266	12169	1436	<1	374	1503	166037	55.57
Motor Vehicles	377	125005	21392	11829	945	<1	365	1149	161062	53.91
Aircraft	34	2786	815	252	415	<1	<1	324	4626	1.55
Locomotive	4	83	59	88	76	<1	9	30	349	0.12
INDUSTRIAL	335	53981	11454	14310	18770	1113	8841	21353	130157	43.56
Steam Electric	104	17	718	11435	13414	161	32	760	26641	8.92
Other Industrial	231	53964	10736	2875	5356	952	8809	20593	103516	34.64
Aircraft	56	199	73	363	699	890	1	211	2492	0.83
Concrete Batch								109	109	0.04
Asphalt Batch	1	1	2	64	330	4	<1	163	565	0.19
Sugar	170	53762	9975	2334	4206	56	8807	20085	99395	33.27
Processing	4	2	7	114	121	2	1	25	276	0.09
Other Solvent			679						679	0.23
REFUSE DISPOSAL	<1	237	83	34	2	<1	39	54	449	0.15
Incineration	<1	17	5	6	2	<1	<1	13	43	0.01
Open Burning	<1	220	78	28	<1	<1	39	41	406	0.14
RESIDENTIAL AND COMMERCIAL HEATING AND COOLING	23	23	23	954	908	9	<1	195	2135	0.71
TOTAL	773	182115	33826	27467	21116	1122	9254	23105	298778	



# LEGEND

- ① PERMANENT STATION
- MAJOR POINT SOURCES
- AIR MONITORING LAB
- ▲ SO<sub>2</sub> STATION
- 1 POWER PLANT
- 2 " "
- 3 JET TEST FACILITY
- 4 AIRCRAFT POWER PLANT
- 5 ROCKET TEST FACILITY
- 6 ASPHALT PLANT
- 7 " "
- 8 " "
- 9 COUNTY DUMP
- 10 MUNICIPAL DUMP
- 11 " "
- 12 SUGAR MILL
- 13 " "
- 14 " "
- 15 " "
- 16 " "
- 17 " "
- 18 " "
- SUGAR CANE FIELDS

